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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/811,481	03/26/2004	Mathieu Robart	50886-00024USPX	8876

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EXAMINER
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SAJOUS, WESNER

ART UNIT	PAPER NUMBER
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2628

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/19/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/811,481	<b>Applicant(s)</b> ROBART, MATHIEU	
	<b>Examiner</b> Sajous Wesner	<b>Art Unit</b> 2628	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 9, 10, 13, 14 and 18-21 is/are rejected.
- 7) ☒ Claim(s) 4, 6-8, 11, 12, 15-17 and 22-25 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>8/6/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

### **DETAILED ACTION**

This is a first Office Action on the merit. Claims 1-29 are presented for examination.

#### ***Claim Objections***

1. Claims 1, 8 are objected to because of the following informalities: In claim 1, the Applicant is suggested to replace “,” after “first” and “second”. And, since there is only one shadow-casting object and one shadow-receiving object, it is not necessary for the claim to recite “a first, shadow-casting object” and “a second, shadow-receiving object”. Thus, the Examiner suggests deleting “first,” and “second,” in lines 1-3 of the claim. In addition, the claim recites “the shadow receiving surface” in lines 4-5, which lacks sufficient antecedent basis. To correct the error, the applicant is suggested to replace “the” with -a-. Claim 8 recites the same problem of claim and requires the same suggested corrections as claim 1. Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 9-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 recites the limitation “a primary depth buffer arranged to store a shadow map from a first pass, being for each of the plurality of

pixels the distance between said at least one light source and the first shadow-casting object" that renders the claim indefinite, for it is unclear as to what the applicant is trying to encompass by this limitation.

Claim 10 is rejected under the same rationale as claim 9.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-3, 5, 13-14, 18-21, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Snyder et al. (US 6252608).

Considering claim 1, Snyder discloses a method of rendering an image comprising at least one light source, a first, shadow-casting object with a second, shadow-receiving object located on the side of the first shadow-casting object remote from said at least one light source (see fig. 32 and col. 86, lines 30-40 and lines 60-65, wherein the frontmost object corresponds with shadow-casting object, and the second frontmost object corresponds to the shadow-receiving object), the method comprising: generating a shadow mask which identifies for each of a plurality of pixels on the shadow receiving surface a grey level representing the intensity of shadow in each pixel, the intensity being determined utilizing the distance between the shadow-casting object and the shadow-receiving object. See col. 91, lines 13-23.

As per claims 2-3, Snyder discloses generating the distance between the shadow casting object and the shadow receiving surface by generating a primary depth being the distance between the light source and the shadow-casting object and a secondary depth being the distance between the light source and the shadow-receiving surface; and comparing the primary and secondary depths, wherein the primary depth is stored in a primary depth buffer and the secondary depth is stored in a secondary depth buffer (as characterized by the descriptions at col. 85, lines 45-56 and col. 86, lines 30-40 and col. 86 lines 60 to col. 87, line 32, wherein the depth-buffers corresponds with the Z-buffer).

Re claim 5, Snyder discloses a first pass of the image is implemented from the point of view of said at least one light source, prior to generating the shadow mask. See col. 84, lines 12-20.

Regarding claim 13, Snyder, at figs. 9-11, discloses an image rendering pipeline including a polygon identification stage and a pixel rendering stage, wherein the pixel rendering stage comprises: rasterizing pixel parameters for each pixel, including a color parameter (see col. 19, lines 31-40); a texture mapping stage which modifies said color parameter according to texture values (see col. 20, line 9 to col. 21, line 50); and a shadow mask determination stage which generates a shadow mask identifying for each of a plurality of pixels on a shadow receiving surface a grey level representing the intensity of shadow in each pixel, the intensity having been determined utilizing the distance between a shadow-casting object and the shadow-receiving object (see col. 91, lines 13-23); wherein the texture value is modulated using each grey level whereby

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soft shadows in the final image can be rendered (see col. 80, line 47 to col. 82, line 50, wherein the rendered high quality image encompasses the soft shadows final image).

Claims 14 and 19 contain features that are analogous to the limitations recited in claim 1. As the limitations of claim 1 have been anticipated by Snyder. It is readily apparent that the applied prior art performs the underlying elements. As such, the limitations of combined claims 14 and 19 are rejected under the same rationale as claim 1. In particular, Snyder discloses calculating a distance between points on the shadow receiver and points on the shadow caster which are aligned with the light source. See col. 87, lines 45-59.

Claim 18 is rejected under the same rationale as claim 2.

Re claim 20, Snyder, at col. 91, lines 13-23, discloses shadow color is based on grey level.

Considering claim 21, Snyder discloses a system for rendering an image containing a shadow of a shadow caster which is positioned between a light source and a shadow receiver (see fig. 32 and col. 86, lines 30-40 and lines 60-65, wherein the frontmost object corresponds with shadow-casting object, and the second frontmost object corresponds to the shadow-receiving object), comprising: a memory (102, fig. 1) storing a shadow mask including information identifying a distance between points on the shadow receiver and points on the shadow caster which are aligned with the light source; and an image rendering processor (106, fig. 1) that renders an image of the shadow receiver to include the shadow with an image intensity at points on the shadow

receiver that depends upon the calculated distances in the stored shadow mask. See col. 84, line 12 to col. 86, line 65.

Claim 26 contain features that are analogous to the limitations recited in claim 14. As the limitations of claim 14 have been anticipated by Snyder. It is readily apparent that the applied prior art performs the underlying elements. As such, the limitations of claim 26 are rejected under the same rationale as claim 14. Particularly, Snyder discloses a polygon identification stage (see figs. 5A-B); a pixel rendering stage (see figs. 6 and/or 9); and the two-pass rendering stage (see col. 77, line 22 to col. 87, line 65).

#### ***Allowable Subject Matter***

6. Claims 4, 6-8, 11-12, 15-17 and 22-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, because the prior art of record fail to teach a shadow mask which identifies for each of a plurality of pixels on the object receiving surface a grey level representing the intensity of shadow in each pixel, the intensity having been determined utilizing the distance between the shadow-casting object and the shadow-receiving object; and processing means for utilizing the shadow mask to render the image by adjusting the color of each pixel based on said grey level representing the intensity of shadow (as recited in claims 7 and 8), wherein each grey level is generated using a texture hierarchy having respectively different levels of blur (as recited in claim 4); implementing a second of the image from the view

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point of a camera after generating the shadow mask (as recited in claim 6), wherein the image intensity is greater for smaller calculated distances and smaller for greater calculated distances (as recited in claims 15 and 23 and 27), wherein an edge of the shadow image is sharper for smaller calculated distances and blurrier for greater calculated distances (as recited in claims 16 and 24 and 28), wherein the shadow image intensity at each point on the shadow receiver is inversely related to the calculated distance for that point (as recited in claims 17 and 25), wherein the processor performs image fragment shading based on the stored shadow mask to adjust a color of each point on the shadow receiver for each image fragment (as recited in claim 22), wherein the shadow image intensity at each point on the shadow receiver is inversely related to the calculated distance for that point in the shadow mask (as recited in claim 29).

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Hong (US 20050017974) discloses a shadow-casting object and a shadow-receiving object located on the side of the shadow-casting object remote from a light source. See paragraph 10.

Girard (US 20040032409) discloses an image generating data.

Smith, Jr. et al. (6690369) discloses a system that perform multi-pass rendering for determining primitives that are visible.




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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sajous Wesner whose telephone number is 571-272-7791. The examiner can normally be reached on M-F 9:15-6:45.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 571-272-7664. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Sajous Wesner  
Primary Examiner  
Art Unit 2628

WS  
3/18/07